

**Bonneville Power Administration
Fish and Wildlife Program FY99 Proposal Form**

Section 1. General administrative information

Evaluate Columbia River Select Area Fisheries

Bonneville project number, if an ongoing project 9306000

Business name of agency, institution or organization requesting funding
Oregon Dept. of Fish & Wildlife, Washington Dept. Fish & Wildlife, Clatsop County
Economic Development Council

Business acronym (if appropriate) ODFW, WDFW, CEDC

Proposal contact person or principal investigator:

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Subcontractors. List one subcontractor per row; to add more rows, press Alt-Insert from within this table

Organization	Mailing Address	City, ST Zip	Contact Name

NPPC Program Measure Number(s) which this project addresses.
8.3C

NMFS Biological Opinion Number(s) which this project addresses.

Biological Opinion for 1995-98 Hatchery Operations - Lower Columbia. Consultation No. 383. Fall Harvest Biological Opinion No. 898.

Impacts on Listed Snake River Salmon by Fisheries Conducted Pursuant to the 1996-1998 Management Agreement for Upper Columbia River Fall Chinook: Biological Opinion, Endangered Species Act - Section 7, Consultation.

Impacts of the 1996-1998 Management Agreement for Upper Columbia River Spring Chinook, Summer Chinook, and Sockeye on Listed Snake River Salmon: Biological Opinion, Endangered Species Act - Section 7, Consultation.

Other planning document references.

If the project type is "Watershed" (see Section 2), reference any demonstrable support from affected agencies, tribes, local watershed groups, and public and/or private landowners, and cite available documentation.

Snake River Salmon Recovery Plan (NMFS): 3.4.b.; Strategy for Salmon, V3 (NPPC): 5.3C;

UPSTREAM: Salmon and Society in the Pacific Northwest (Hatchery changes to assist recovery of wild populations, chap. 6, 11, 12);

Lower Columbia River Terminal Fisheries Project: DOE/EA - 1040;

Washington Department of Fish and Wildlife. Wild Salmonid Policy - Final Environmental Impact Statement. September, 1997 (Chap. IV, Sect. 3.3, pp 76-79);

Lower Columbia River Salmon Business Plan for Terminal Fisheries, Final Report: DOE/BP - 39254-1. October, 1996.

Subbasin.

Lower Columbia basin and side channels, including: Deep River, Steamboat Slough (Skamokawa Cr.), Cathlamet Channel, Youngs Bay, Tongue Point Basin, Blind Slough (Gnat Cr.), Clifton Channel, and Wallace Slough (Clatskanie R.).

Short description.

Protect depressed stocks by determining the feasibility of creating and expanding select

area (terminal) fisheries to allow harvest of strong anadromous salmonid stocks. Evaluate hatchery stocks in net pen rearing experiments relative to rearing costs, disease, and rearing/release strategies (time, size & density). Document changes or effect on habitat through monitoring of water chemistry and benthic biological communities.

Section 2. Key words

Mark	Programmatic Categories	Mark	Activities	Mark	Project Types
X	Anadromous fish		Construction		Watershed
	Resident fish		O & M		Biodiversity/genetics
	Wildlife		Production		Population dynamics
+	Oceans/estuaries	+	Research		Ecosystems
	Climate	X	Monitoring/eval.		Flow/survival
	Other	+	Resource mgmt		Fish disease
			Planning/admin.	X	Supplementation
			Enforcement		Wildlife habitat enhancement/restoration
			Acquisitions		

Other keywords.

Target stocks, Select areas (terminal fisheries), net pens, depressed stocks, harvest impacts, acclimation rearing

Section 3. Relationships to other Bonneville projects

Project #	Project title/description	Nature of relationship
9702400	Juvenile Salmonids in the Columbia River Basin	Release strategies using net pens
9202200	Wild Smolt Behavior/Physiology (ESA)	Rearing strategies using net pens
8201300	Coded-Wire Tag Recovery	Coordinated CWT Recovery Program
8906900	Annual Coded Wire Tag Program-Missing Production OR HTC (ODFW)	CWT Program for Comparison of Study Fish to Production Fish
8906600	Annual Coded Wire Tag Program-Missing Production WA HTCH (WDF)	CWT Program for Comparison of Study fish to Production Fish

Section 4. Objectives, tasks and schedules

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task
1	Determine suitability of various sites for rearing and release of salmon	a	Conduct water quality monitoring program
		b	Collect and analyze homing and straying information from current net pen programs
2	Determine the potential for various sites for harvest of target and non-target fish stocks	a	Continue limited test fishing during spring and fall periods
		b	Initiate and evaluate commercial and recreational select area fisheries
3	Continue feasibility investigation of cooperative sport fishery harvest in select fishing areas	a	Meet with sports spokes groups
		b	Review literature pertinent to sport harvest in select area off-channel locations
		c	Determine harvest potential of sport fisheries
		d	Describe effect of shifting various levels of historic mainstem lower Columbia River sport fisheries
		e	Re-evaluate initial list of sites in terms of sport harvest potential
4	Evaluate suitability of various anadromous fish stocks for use in select area fishing sites	a	Evaluate effects of various rearing regimes for spring chinook in Oregon and Washington
		b	Evaluate effects of various rearing regimes for Select Area Bright fall chinook in Oregon
		c	Evaluate effects of various rearing regimes of early stock lower Columbia River coho in OR & WA

5	Coordinate activities with WDFW, ODFW, CEDC, BPA, NMFS, and Salmon For All (SFA)	a	Coordinate all objectives and tasks undertaken jointly to ensure complementary products and minimal overlap of actions
		b	Co-host bimonthly coordination meetings of involved or interested parties to further develop work plans and report on progress
		c	Promote dialogue and participation in all projects that are affected by select area fishery development
6	Continue construction activities to develop additional research capabilities at select area fishery sites	a	Undertake initial site preparation and obtain necessary permit approvals
		b	Develop and implement rearing strategies at appropriate sites

Objective schedules and costs

Objective #	Start Date mm/yyyy	End Date mm/yyyy	Cost %
1	01/1994	09/2003	11%
2	01/1994	09/2003	10%
3	10/1997	09/2001	6%
4	10/1995	09/2003	56%
5	09/1993	09/2003	6%
6	09/1994	09/2001	11%

Schedule constraints.

Project is most influenced by extent of budget and availability of juvenile fish. This ongoing project's schedule has plans for annual additions of sites and increases in fish reared. Local worst ever oceanic conditions will hinder evaluation of survival rates.

Completion date.

2004

Section 5. Budget

FY99 budget by line item

Item	Note	FY99
Personnel		416,550
Fringe benefits		159,134
Supplies, materials, non-expendable property	Variable costs (ie. fish food, CWTs, replacement supplies, tagging)	368,290
Operations & maintenance	Annual fixed costs (ie. leases and fees)	87,160
Capital acquisitions or improvements (e.g. land, buildings, major equip.)		219,600
PIT tags	# of tags:	
Travel		36,030
Indirect costs		170,766
Subcontracts		42,470
Other		
TOTAL		\$1,500,000

Outyear costs

Outyear costs	FY2000	FY01	FY02	FY03
Total budget	1,500,000	1,500,000	1,500,000	1,500,000
O&M as % of total	10%	10%	10%	10%

Section 6. Abstract

f. How results will be monitored and evaluated

In its 1993 Strategy For Salmon, the Northwest Power Planning Council recommended that select area (formerly terminal area) fishing sites be identified and developed to harvest abundant fish stocks while minimizing the incidental harvest of weak stocks. The Council, through its Fish and Wildlife Program, called on the BPA to: "Fund a study to evaluate potential terminal fishery sties and opportunities. This study should include: general requirements for developing those sites (e.g., construction of acclimation/release facilities for hatchery smolts so that adult salmon would return to the area for harvest); the potential number of harvesters that might be accommodated; type of gear to be used; and other relevant information needed to determine the feasibility and magnitude of the program"(NPPC, '94).

Beginning in 1993, BPA initiated the Columbia River Terminal Fisheries Project (now the Columbia River Select Area Fishery Evaluation Project), a 10-year comprehensive program to investigate the feasibility of select area fisheries in Youngs Bay and other sites in Oregon and Washington (BPA 1996). Select area fisheries are being explored as a means to increase the sport and commercial harvest of hatchery fish while providing greater protection of weak wild salmon stocks. The project is being

conducted in three distinct stages: an initial 2-year research stage to investigate potential sites, salmon stocks and methodologies (1994-95); a second 3-year stage of expansion in Youngs Bay and introduction into areas of greater potential as shown from the initial stage (1996-98); and a final 5-year phase of establishment of select area fisheries at full capacity at all acceptable sites (1999-2003).

The goal of the project is to determine the feasibility of creating and expanding select area, known stock fisheries in the Columbia River Basin to allow harvest of strong anadromous salmonid stocks while providing greater protection to depressed fish stocks.

Water quality parameters are monitored through utilization of electronic automated probe and benthic sampling following Washington DOE and Oregon DEQ requirements. Results will be monitored and evaluated through regionally standardized and required coded-wire tagging and recovery procedures.

Section 7. Project description

a. Technical and/or scientific background.

The overall problem is how to meet the needs of society for sustainable populations of fish that support harvest while minimizing impacts on protected weak stocks. The goal of measure 8.3C of the Northwest Power Planning Council (NPPC) Fish and Wildlife Program calls for identification and development of terminal fishing opportunities to harvest abundant stocks while minimizing the incidental harvest of weak stocks. Responsive to the Council's Fish and Wildlife Program and through select area fishery development, this project evaluates the alteration of artificial production to fit into the Columbia Basin ecosystem.

Beginning in 1987 CEDC initiated a small scale net pen acclimation project in Youngs Bay under the leadership of Duncan Law and Jim Hill. As a result of early net pen successes, meetings with BPA, ODFW, CEDC, SFA and local fishing industry representatives prompted further fishery development. In response to amendment measures IV (B)(9)(b) and 5.3C in the NPPC amended Fish and Wildlife Program, which call for the creation of terminal fishing opportunities to reduce main-stem Columbia River harvest pressure on depressed Columbia River basin stocks (NPPC 1991, 1992), BPA funded Project No. 92-77: Evaluation of 1991-1992 Brood Overwinter-Reared Coho Released from Net Pens in Youngs Bay, Oregon, conducted by Paul Hirose (ODFW), Jim Hill (CEDC) and Rick Westerhof (BPA). Results included 1) successful estuarine net pen rearing, 2) adult survivals were at least double those of traditional hatchery programs, 3) high homing instincts were realized with less than 1% stray rates, and 4) nearly all (99%) of the adult production resulting from Youngs Bay coho net pen releases were accountable in fishery harvests.

b. **Proposal objectives.**

COLUMBIA RIVER: SELECT AREA FISHERY EVALUATION PROJECT

PURPOSE: Determine the feasibility of creating or expanding select area, known stock fisheries in the Columbia River basin to allow harvest of strong anadromous salmonid stocks while providing greater protection of depressed fish stocks.

OBJECTIVE 1. Determine suitability of the Deep River, Steamboat Slough, Tongue Point Turning Basin, Blind Slough, and Clifton Channel sites for rearing and release of salmon.

Task a. Conduct water quality monitoring program for rearing areas in selected sites for the entire year. Water column parameters, benthic sediment and organisms, and planktonic characteristics to be measured at rearing sites using established schedule. (ODFW, WDFW & CEDC)

Product: Report of measured water quality data by site.

Task b. Continue to collect and analyze homing and straying information from current net pen programs, select area bright (Rogue River stock) and lower Columbia River hatchery programs. (ODFW & CEDC)

Product: Report of homing and straying of fish stocks considered for use in select areas.

OBJECTIVE 2. Determine the potential for the Tongue Point Turning Basin, South Channel, Deep River, Blind Slough, Prairie Channel, Steamboat Slough, and Clifton Channel sites for harvest of target and non-target fish stocks.

Task a. Continue limited test fishing during spring and fall periods to determine relative abundance and timing through the area of non-target fish stocks. (WDFW & ODFW)

Product: Reports of relative abundance and run timing of target and non-target species/stocks.

Task b. Initiation and evaluation of commercial and recreational select area fisheries. (WDFW & ODFW)

Product: Report of select area fishery harvest and biological information.

OBJECTIVE 3. Continue investigation of feasibility of cooperative, manageable sport fishery harvest in select fishing areas. (ODFW & WDFW)

Task a. Meet with recreational industry groups to consult on issues, rules, criteria, and conditions regarding fishing in select areas.

Task b. Review literature pertinent to sport harvest in select area off-channel locations.

Task c. Determine harvest potential of sport fisheries directed at various target stocks and handle of non-target stocks.

Task d. Describe effect of shifting various levels of historic mainstem

lower Columbia River sport fisheries to select area sites on upriver runs and other lower river tributary runs.

Task e. Re-evaluation of initial list of sites in terms of sport harvest potential.

Product: Report discussing the feasibility and limitations of sport fishing opportunities in select area sites.

OBJECTIVE 4. Evaluate the suitability of various anadromous fish stocks for use in select area fishing sites.

Task a. Evaluate the effects in various rearing regimes for spring chinook on survival and contribution to fisheries in Oregon and Washington; '94 - '97 broods. (WDFW, ODFW, & CEDC)

Product: Report of 1999 releases for 1997 brood with significant findings related to rearing and release, and report on development of rearing and release strategy.

Task b. Evaluate effects of various rearing regimes in Oregon of "Select Area Brights" (SABs), formerly Rogue River fall chinook, on survival, contributions to fisheries, and straying; '94 - '98 broods. (CEDC & ODFW)

Product: Report of 1999 releases of '98 brood SABs with significant findings related to rearing and release.

Task c. Evaluate effects of various rearing regimes of early stock lower Columbia River coho on survival and contribution to fisheries; '96 - '98 broods. (CEDC, ODFW & WDFW)

Product: Report of 1999 releases of '97 brood coho and development of 2000 rearing and release strategy.

OBJECTIVE 5. Coordinate activities with WDFW, ODFW, CEDC, BPA, NMFS, and SFA. (WDFW & ODFW)

Task a. Coordinate all objectives, tasks, and activities undertaken jointly to ensure complementary products and minimal overlap of actions.

Task b. Co-host bimonthly coordination meetings of involved or interested parties to further develop work plans and report on progress.

Task c. Promote dialogue and participation in all projects that are affected by select area fisheries development.

Product: Bimonthly coordination meetings and other meetings attended during contract period.

OBJECTIVE 6. Continue construction activities to develop additional research capabilities at select area fishery sites. (CEDC, ODFW & WDFW)

Task a. Undertake initial site preparation and obtain necessary permit approvals.

Task b. Develop and implement rearing strategies at appropriate sites.

Product: Preliminary report on progress.

c. Rationale and significance to Regional Programs.

This on-going project will further the FWP long-term goal of biological diversity by rebuilding weak runs and providing sustainable and adequate harvest levels for tribal, sport and commercial fisheries. This project will provide information needed to determine the potential magnitude of known-stock fishery opportunities in the lower Columbia River. Utilizing results of project objectives we will provide sites for rearing and harvest, provide for harvest (sport and commercial) of target stocks while avoiding harvest of weak stocks, select appropriate fish stocks for each site, coordinate all activities with management entities, and continue to provide additional needed research.

In collaboration with Walt Dickoff (NMFS), Project No. 9202200: Wild Smolt Behavior/Physiology (ESA), naturalized rearing strategies are being researched in estuarine net pens to validate laboratory findings. Information gained will provide direction to apply rearing strategies to optimize smolt-to-adult survival. A bimonthly sampling schedule to determine various physiological characteristics is in place.

Through information gained from Project No. 97024000: Juvenile Salmonids in the Columbia River Basin, release strategies from estuarine net pens may be employed to avoid excessive avian predation.

Through the three CWT programs [Project No. 8201300: Coded-Wire Tag Recovery, Project No. 8906900: Annual Coded-Wire Tag Program - Missing Production OR HTC (ODFW), and Project No. 8906600: Annual Coded-Wire Tag Program - Missing Production WA HTCH (WDF)], recovery information is essential for this project to evaluate fishery contributions, escapement levels, total survival rates, and comparison of study fish to production fish.

Select area fisheries provided the vast majority of commercial harvest in the lower Columbia River of spring chinook and coho in 1996-97.

d. Project history

- summary of major results achieved - past costs (see attached spreadsheet)

This project (No. 9306000) is an on-going evaluation initiated through Project #92-77: Youngs Bay Terminal Fishery Project. With results published as a final completion report (Hirose, 1997), feasibility and expansion of potential select area/net pen sites is addressed in the current on-going project. The current project has been underway since FY 93, with a cumulative cost to date of \$4,190,000:

<u>Fiscal Year</u>	<u>Budget</u>
1993	\$417,900
1994	\$535,500
1995	\$765,400
1996	\$785,900
1997	\$785,000*
1998	&900,000*

* Budget shortfall has hindered meeting scheduled project goals.

Results to date include:

- 1) categorization and ranking of potential sites;
- 2) seven highest ranked sites selected for further study;
- 3) documented water quality data at each of the seven highest ranked sites;
- 4) modeled the effects of shifting mainstem Columbia River harvest to select areas on the up-river bright fall chinook stock;
- 5) defined time and area harvest parameters in the seven select areas during spring and fall seasons;
- 6) selected suitable fish stocks that meet rearing, harvest, economic and ecological considerations;
- 7) implemented rearing and release strategies at four sites with a total release to-date of approximately 2.3 million spring chinook, 2.2 million coho, and 1.9 fall chinook;
- 8) provided for harvest opportunities in Youngs Bay, Blind Slough, Tongue Point and Deep River, WA, that included 1,400 spring chinook (Youngs Bay, 1997), approximately 8,000 coho in 1996 and 5,000 in 1997 (Youngs Bay, Tongue Point, Blind Slough and Deep River), and approximately 1,000 and 1,700 fall chinook in Youngs Bay in 1996 and 1997, respectively;
- 9) returns from coho releases in select areas indicate 99% accountability in fish harvest;
- 10) adult survival of coho releases from select areas is at least twice that of traditional hatchery releases;
- 11) less than 1% of coho adults were accounted for at adjacent hatcheries; and
- 12) to-date, harvest impacts in select areas on weak stocks have been well below federally mandated impact guidelines.

This project applies actions designed to increase understanding through fishery enhancement experimentation that will provide useful information for future management decisions and actions. Through the monitoring and evaluation aspects of this project, valuable information is continuously being learned that provides direction and application of the adaptive management approach of the Columbia River Basin Fish & Wildlife Program.

e. Methods.

Project design is simply to utilize hatchery fingerling production for acclimation and rearing in lower Columbia River off-channel areas with studies designed to determine which rearing variables (size, release time, rearing densities, release sites) would maximize survival, minimize straying, optimize economic benefits, while best utilizing hatchery production and minimizing weak stock impacts.

Monitoring of water quality combines use of a Hydrolab multi parameter water testing device and seasonal benthic macroinvertebrate population monitoring using standard grabber and laboratory methods.

Standardized fish husbandry methods and net pen construction established from experience in Youngs Bay is the procedure used. Coded wire tagging (CWT) and

finclipping of representative numbers of each group is conducted with methods standardized coast wide. Recovery of CWTs is a product of a coordinated coast wide effort and essential for study evaluation.

Determination of background level of non-targeted stocks is accomplished using contract fishermen in each select area site. Data are compared using a measure of catch per unit of effort.

Analysis of data generated by returns of adult study fish will be based on CWT recoveries. Statistical comparisons will be done utilizing existing standard methodology inclusive in the CWT recovery program.

Studies to-date include the rearing, release and harvest of the following salmon stocks and numbers:

<u>Brood Years</u>	<u>Species</u>	<u>No. Released</u>
1994-96	Fall Chinook	750,000/Yr
	Spring Chinook	925,000/Yr
	Coho	800,000/Yr
1997	Fall Chinook	125,000
	Spring Chinook	1,050,000
	Coho	1,200,000

f. Facilities and equipment.

Administration of the project is conducted out of the ODFW office in Clackamas, the WDFW office in Vancouver, and the CEDC office in Astoria. In the WDFW/Vancouver office a water quality laboratory has been established. The project stores most field equipment at regional hatcheries adjacent to the select area sites where fish are reared.

Experimental fish essential for the project are initially reared at WDFW's Grays River, Elochoman and Cowlitz hatchery facilities, and at the ODFW facilities; Gnat Creek, Bonneville complex, and Klaskanine.

Major equipment includes net pens at Youngs Bay (80), Tongue Point (16), Blind Slough (16) and Deep River (16). Also included are two Hydrolab water sampling devices, two computers, and two motorized barges.

As expansion to additional sites develops, associated increases in net pen numbers, equipment, and materials & supplies will be necessary.

g. References.

References:

NPPC 1991. Northwest Power Planning Council, 1991. Amendment to the Columbia River Basin Fish and Wildlife Program (phase two). 87 pp.

NPPC 1992. Northwest Power Planning Council, 1992. Strategy for salmon. Volume II. 98 pp.

NPPC 1994. Duncan, Angus et al. Columbia River Basin Fish and Wildlife Program, Northwest Power Planning Council (Portland, December 1994). P. I-3.

Hirose, Paul, Marc Miller, & Jim Hill. 1996. Columbia River: Terminal Fisheries Research Project. 1994 Annual Report. Bonneville Power Administration. DOE/BP - 05409-1. 151 pp.

Hirose, Paul S. 1997. Evaluation of the 1991-1992 brood overwinter-reared coho released from net pens in Youngs Bay, Oregon. Final Completion Report. Bonneville Power Administration. DOE/BP 81679-1. 27 pp.

Section 8. Relationships to other projects

Discussion of work funded under the FWP can be found in Section 7c: Project Description, Rationale and Significance to Regional Programs. The following discussion covers relationships to non-FWP entities.

Coordination and approval for reprogramming of fish stocking programs is essential at all levels; internal within WDFW and ODFW, in forums or individually with other agencies, and within requirements and guidelines of the ESA and Production Advisory Committee (PAC). NEPA requirements have been met however an EIS may be needed. Permits with Oregon Department of Environmental Quality (DEQ) and Washington Department of Ecology (WDOE) are necessary along with local city, county and other state agencies. Lease agreements with private landowners are necessary.

Commercial harvest regulations require Columbia River Compact action in concurrent waters and states' action in state waters. Coordination with the appropriate enforcement agencies is essential. Sport harvest proposals must be reviewed by enforcement and coordinated between states (OR & WA) for consistency.

All harvest must be addressed in the ESA process involving the Technical Advisory Committee (TAC) of the Columbia River Fish Management Plan as author of biological assessments concerning fishery impacts. Final approval of fisheries and harvest are then the responsibility of the National Marine Fisheries Service (NMFS).

Section 9. Key personnel

SAFE Project is a three agency cooperative project led by Jim Hill, Paul Hirose and Marc Miller.

Jim Hill, CEDC (1978 to present), Fisheries Project Director. Bachelors of Science (Fisheries Science) from Oregon State University in 1977. Through Clatsop County's Economic Development Council the current primary responsibility is to provide leadership for the successful salmon enhancement program in Youngs Bay and other test sites. Through this program, the concept of net-pen acclimation in the lower

Columbia was pioneered.

Primary responsibilities associated with the Select Area Fishery Evaluation Project are to provide oversight, advise, coordination, and supervise activities regarding the experimental releases of fish, including collaboration with others.

Relevant Publications:

Hill, James M. and Todd Olson 1988. Evaluatyion of a low-cost salmon production facility. Bonneville Power Administration: DOE/BP - 11887-4. 38 pp.

Hirose, Paul, Marc Miller & Jim Hill. 1996. Columbia River: Terminal Fisheries Research Project, 1994 Annual Report. Bonneville Power Administration: DOE/BP-05409-1. 151 pp.

Paul S. Hirose, ODFW (1971 to present), Natural Resources Specialist 3. Bachelor of Science in Fisheries Science in 1968, from the University of Washington.

Entire professional career (27 years) in the Columbia River Management Group with the State of Oregon.

During 1971-87 (17 years) employed as assistant project leader responsible for management of the Lower Columbia River commercial fisheries. Primary duties during this period included: 1) coordination of commercial fishery sampling programs, 2) coordination of spawning sampling programs, 3) development of preseason run size predictions for Oregon Production Index (OPI) coho and upriver spring chinook, 4) development of estimates for incidental handle and mortality of steelhead caught during winter salmon gillnet seasons, 5) determine the stock composition of spring chinook landed in winter salmon gillnet seasons, 6) coordination of gillnet test fishing programs for spring chinook at Woody Island (RM 28), sockeye in Zones 1-2, and fall salmon in Zones 1-2.

During 1988 to present, promoted to the project leader (NRS 3) with responsibilities in the same areas as in previous years. Additional duties include developing recommendations for commercial fishing seasons in the lower Columbia River including Youngs Bay. During 1991-95, acted as ODFW technical contact for "Youngs Bay Terminal Fisheries Project" funded by BPA (Project No. 97-22). During 1993-present, principle duties include ODFW technical contact for "Columbia River Select Area Fisheries Evaluation Project" (formerly titled "Columbia River Terminal Fisheries Research Project"), Project No. 9306000.

As project leader of the Oregon portion of the Columbia River Select Area Fisheries Evaluation (SAFE) Project, Paul Hirose is responsible for coordinating and directing tasks and activities relating to Oregon select areas. Coordination of work with Jim Hill (CEDC) and Marc Miller (WDFW) is essential for effective execution of the SAFE project.

Relevant Publications:

Final Completion Report: Evaluation of 1991-92 Brood Overwinter-Reared Coho

Released from Net Pens in Youngs Bay, Oregon.

Columbia River: Terminal Fisheries Research Project. 1994 Annual Report. Project No. 93060.

Authored several management staff reports documenting results of test fishing, spawning fish surveys, and on-board monitoring to estimate steelhead hand during target salmon gill net fisheries.

Marc Miller, WDFW (1973 to present), Fish & Wildlife Biologist 3. Bachelor of Science (Fishery Science) from Humboldt State University in 1973. Specialized in salmon fishery management for length of employment with WDFW: PFMC ocean fishery plan development (1973-1979), ocean salmon fishery monitoring (1979-1990), application of genetic stock identification to salmon fishery management (1985-1993), and select area fishery development (1993 to present).

Recent activities (1993 to present) have been out of the WDFW field office in Battle Ground/Vancouver, as project leader on the Washington portion of the Select Area Fishery Evaluation Project (9306000). In the first year, several Washington sites were established as having potential and each has been monitored for existing fish populations and water quality characteristics. Net pens were placed in Deep River in 1995 and two fisheries have been conducted on early run coho reared at the site. The project is now expanding within Deep River, and to Steamboat Slough.

Relevant Publications:

Miller, Marc, Cindy LeFleur, Anne Marshall, & Paul Hirose. 1993. Genetic stock identification estimates of spring chinook stock composition in the Columbia River winter gill net fishery, 1987-1992. Washington Department of Fisheries. Tech. Rept. #121. 16 pp.

Hirose, Paul, Marc Miller & Jim Hill. 1996. Columbia River: Terminal Fisheries Research Project, 1994 Annual Report. Bonneville Power Administration: DOE/BP - 05409-1. 151 pp.

Authored several WDFW technical reports relative to salmon fishery monitoring and management.

Section 10. Information/technology transfer

Technical information from this project will be distributed through annual reports, public and professional meetings, and Salmon For All's educational and promotional activities associated with select area fisheries. Continued opportunities for media coverage include Oregon Public Broadcasting documentaries, live radio talk shows, newspaper stories and local television news coverage (special interest). Provide information to commercial interests (banks) regarding future potential of select area fisheries. Finally, meetings with policy level interests will be attended and promoted.